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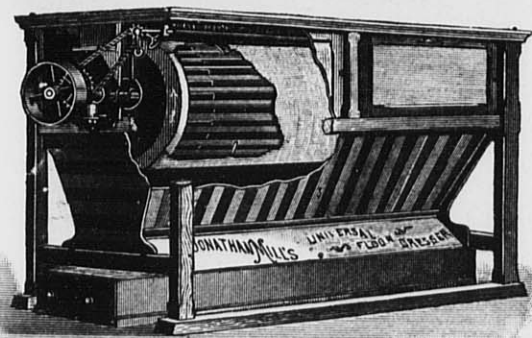
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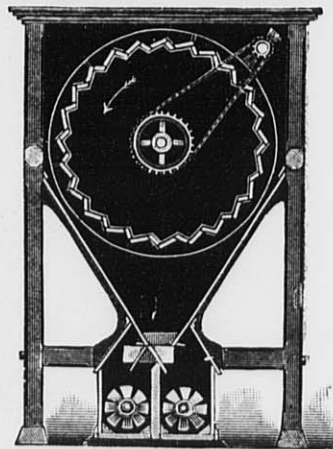
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TRANSMISSION OF POWER BY BELTING.

At the recent meeting in Philadelphia of the National Electric Light Convention, Mr. J. H. Shay, of Munson & Co., Chicago, read a very interesting paper, a part of which is here reproduced, on the above subject.

The transmission of power from its origin at the driving wheel to the receiving pulley or shaft, originated, as nearly all mechanical appliances have done, in necessity, and in their first existence such creations have always been rude and imperfect. Thus, we see in ancient pictures that strips of rawhide were used, more or less twisted, perhaps, but with huge ungainly knots where the ends of these pieces are connected. From this an advance was made until cordage of imperfect construction became common.

The time which elapsed before any reasonably fair belting made its appearance, may be counted by scores of years, and during that long period, of all the various devices the most satisfactory had proved to be a tanned leather belt. Still the users of belts were not happy over the results obtained, and a radical innovation was made when an iron wire cable or rope made a stir for a comparatively short time; yet, except for special purposes, it has found little favor. A few of the more serious objections to a wire rope are perhaps worth mention.

Constant use as a belt will, in a comparatively short time, crystallize and render the wire brittle, when it will, of course, refuse to bear the strain, and gradually give way. The repairing of a broken wire cable belt is extremely difficult, and the mended portion is never the same diameter as before. When it commences to fail it is only a short time until its ruin is complete; and lastly, no round belt has bearing enough to do perfect work, where solid hard labor is required of it, and the wire belting is no better than any other round belt on that account.

Other methods of transmitting power, by gearing, etc., had their day, but these have nearly gone out of use, and there is nothing to be gained by discussing these noisy methods. For the past half century these have been gradually disappearing from view, until we have to search for an existing example outside the industrial centres of the world.

The verdict of the mechanical engineer, everywhere, when called to sit in judgment on this question, is the same; "There is nothing like leather." Yet there are as many kinds and forms of leather as there are of nearly any other animal product, and, while for some purposes other leathers are better suited, the fact is undeniable that for strength, dura-

bility, ease of repair and adhesion, oak-tanned leather captures the blue ribbon and stands superior to any other on all occasions.

The first essential is found in the character of the hide. Due care must be exercised in the tanning, and a thorough and careful selection of hides must be made to insure evenness of stock. Without particular pains in this last requisite uniformity in the belt is impossible. Or the stock must be reduced to a uniform thickness by splitting, which introduces another fault—weakness and consequent want of durability. Having now arrived at the point when the properly selected tanned and sorted stock is ready for cutting and splicing, we have to decide which of several methods is best for attaching the various lengths to form a continuous web or belt.

There are as I have intimated, several methods of attaching these, viz: By thongs of lace leather; by wire hooks; by rivets and burrs; and finally by scarfing and lapping—the two scarf surfaces being cemented under pressure. This has been adopted quite generally by western manufacturers, and any objection to such joints which may have formerly existed is now set at rest through the use of more recent methods and materials.

There are objections to the three methods first mentioned which are at once simple and damaging, from a mechanical point of view. It goes without saying, that a belt punched full of holes for either thongs, hooks, rivets, or any other appliances for fastenings, is weakest at those splices instead of being strongest. Again, any inequality, such as must necessarily arise from any one of these fastenings must result in undue strain on the belt and cause a slapping motion, and thereby reduce the useful work of the power. We may find a still more serious objection farther along. When an important belt is properly constructed, properly proportioned and speeded, and receives the attention and care which it deserves, there is scarcely any limit to its durability. The cause of the failure of many large belts may too often be found in some one of the above particulars. Of course there are other things to be considered. It is a mistake to figure too closely on the length or width of an important belt. Do not risk a possibility of slipping, which means heat, and will ruin the best belt made in an astonishingly short time.

A few years since it was the rule among one class of belt customers to depend almost exclusively on rubber for the severe work required in saw mills. This has now fallen into disuse and has been replaced by leather, this proving better adapted for this purpose.

Of the care of belting in use, a few words may not be out of place. The saturating of belting by any kind of oil is destructive. Belting stock, properly prepared, needs occasionally a slight coating on the grain. The dressings ordinarily offered in the market for this purpose are destructive. They are mostly of the mineral variety, and contain more or less of those light products of distillation known as naphtha, benzine, etc. These combine readily with many vegetable and animal products, and destroy their integrity. There are belt dressings produced which not only do not injure, but really add to the life power of the belt.

RECIPES.

TO WRITE ON GLASS.—An ink that will write on glass can be made from ammonium fluoride dissolved in water and mixed with three times its weight of barium sulphate.

FRENCH POLISH.—The true French polish is one pint of spirits of wine added to a quarter of an ounce of gum opal, the same of gum arabic, and one ounce of shellac. This polish is used for plain wood that has been stained in imitation of natural wood. The principal of action is the floating with oil the gummy or resinous substances into the pores, and bringing the polishing up by rubbing. The simplest varnish is a solution of shellac dissolved in naphtha.

A NEW USE FOR GRAPHITE.—John A. Walker, secretary of the Dixon Crucible Company, says: "From time immemorial steam and gas fitters have used red lead in making joints and connections. It has been a matter of tradition with them that nothing else could possibly answer as well. However, after a few months have passed it is found that the red lead was 'set,' and it is next to impossible to open a joint. The fitter applies his tongs with all his strength, and, in large percentage of cases, the joint is finally broken, and the tongs sprung, sometimes almost beyond repair. The progressive fitter has found that graphite (black lead) carried ready mixed for the purpose, or carried dry and mixed with best boiled oil, as occasion requires, makes an infinitely better joint. Being a natural lubricant it enables the fitter to make a much tighter, and, consequently, a much more perfect joint. Further, a joint so made can remain three months, or three years, or thirty years, and will then yield to the ordinary pressure of the tongs. It will make a better joint with less leakage, and render absolutely unnecessary the breaking of joints and couplings and the straining of tongs. The graphite should be pure and of the right degree of pulverization."

WILLIAM LEE, THE INVENTOR OF THE STOCKING FRAME.

BY GEORGE MAKEPEACE TOWLE.

Those who have strolled through the streets of the old town of Cambridge, in England, will not easily forget the many college edifices which appear on every side, composing the ancient University. Many of these are imposing and beautiful. They are adorned with numerous architectural devices; with arches gables oriel windows, gargoyles, pinnacles, and other sculptured ornaments, and almost all of them bear marks of great age. The air of the town is one of studious repose; it seems a place well suited for quiet study and for the pursuits of tranquil scholars. The old town has changed so little moreover, in the progress of time, that very much as it looks now it looked in the good Queen Elizabeth's time, three centuries ago.

It was in the reign of Elizabeth that a young man named William Lee went up to Cambridge to get an education. Lee was a country lad who had been brought up on a large farm. From childhood he had been fond of study and had had a craving for knowledge. He loved reading and learning far better than the active duties on his father's farm. All the time he was at the University he studied hard and at the end of his course had taken high rank among his comrades. As a reward for his good scholarship he was given a "Fellowship." This provided him with a small income, and enabled him to continue living at the University after graduating, and to there pursue his studies.

Lee was one of those dreamy, thoughtful young men who care for little outside their books, and being much wrapped up in them, learn but little of the ways of the busy world. He was not in the least what we call a "practical man." His life was absorbed in the love and pursuit of book knowledge. He was wholly unfitted for any other kind of work. His destiny seemed to be to live and die a college professor.

And so he might have done if his fate had not led him astray into the paths of love. If he had not fallen in love, the world would have never heard of William Lee. He was fond of wandering through the pretty roads and hedge-bound lanes in the vicinity of Cambridge, taking a book with him on his jaunts, and sauntering dreamily along the paths thinking of what he had been reading.

It chanced that on one of these excursions he met a young country lass with such rosy cheeks and bright eyes that he was at once roused out of his reverie and attracted to her. His dreams now took another turn. He thought less of his books and more of the maiden who had stirred his heart. She lived on a poor little farm some miles away from town, and Lee having succeeded in making her acquaintance, betook himself more and more often to the modest cottage where she dwelt. To his delight his affection was soon returned, and now many were the happy hours which he spent at his rosy-cheeked young lady-love's side. But there was one drawback to his pleasure which greatly worried him. The young girl's parents were very poor and it was her task to eke out the small family income by knitting stockings. She had her household duties to perform during the day, and so she was obliged to take up her knitting

in the evenings. Oftentimes when Lee came she was so busy with her work that she could not talk to him.

At last his patience was exhausted, and he proposed that they should get married. He thought that his income as a "Fellow" would suffice for both, and he would be careful to keep his marriage secret. It was the law of the University that the Fellows should be unmarried men, and Lee saw that if his marriage were known he would lose his fellowship and be thrown upon the world.

So one morning they got married. But Lee's happiness was not long-enduring. His marriage was soon discovered and he was abruptly expelled from his Fellowship in the University. Worse still, when his father heard of the marriage, he disowned poor William, who was now cast upon the world with his young wife without a penny. What should they do? If they did not soon go to work they must soon starve. Every day they grew poorer and more wretched.

His young wife, who was very cheerful and industrious, took up her knitting once more to earn enough, if possible, to support them. As for poor Lee, he was totally unfitted to do anything, and his pride was greatly hurt to sit idly by while his wife toiled patiently, hour after hour on her work.

One day as he sat watching her fingers busily plying the needles a bright thought suddenly struck him. Could not a machine be somehow contrived which imitating human fingers, would knit stockings? If he could only devise such a machine, his wife would no longer have to work so hard, and perhaps it might bring fortune to his poverty-stricken door. It seemed there was something practical in the poor student after all. He set eagerly to work to realize his new idea. He studied such machines as he could find in his neighborhood. He made a great number of models, and was not disheartened when one after another failed to perform the task he had in view. But at last the day came when an actual working stocking frame stood in the miserable little room which was all the home he had. He had successfully carried out the idea of imitating fingers knitting, and to his joy he found himself able to weave stockings on his machine of a finer texture and more rapidly than those which were made by his wife's hands.

It was not long before Lee's great invention became known far and wide. Queen Elizabeth heard of the silk stockings woven by Lee's frame, and having received a pair vowed that she would never wear cloth hose any more, but would always thereafter wear woven silk stockings. The great ladies adopted the fashion, and Lee found himself raised at last above the galling poverty which he had suffered after his marriage. He established himself at Calverton, not far from his native place, and for sometime did a thriving business. But so valuable was his machine that pretty soon unscrupulous men began to make machines like it, and so Lee lost much of the benefit of his invention. Though the proud Elizabeth was glad enough to wear the fine silk stockings, she would not protect him against those who invaded his rights, and when King James came to the throne he also refused to aid the inventor.

But Lee, who had proved himself a far more energetic and able man than he had seemed to be in his studious days, was resolved that he would continue in the industry which he

had created. So he packed up his machines and crossed over to France. There he was heartily welcomed by the great-hearted King, Henry the Fourth, and by Sully, the wise and far-seeing Minister. Lee settled in the beautiful old town of Rouen, where he became so busy that he employed nine men to help him weave stockings. His wife could now sit at home in ease and take care of their children. Happy days had dawned upon them, and it seemed as if their troubles had forever vanished.

One day, however, the good King who had so generously befriended the English inventor was murdered as he was riding in his carriage. Lee was now bitterly persecuted because he was a Protestant. He was forced to give up his establishment at Rouen, and sought obscurity and safety in Paris. There, it is said, he died in poverty and wretchedness before he had passed the middle years of life. Some of his workmen managed to get safely to England, and one of his apprentices, named Aston, set up a stocking factory in his own country, and established the weaving of stockings as a permanent industry of England. Thus Lee's invention proved to be of the greatest benefit to his native land, although he himself did not reap fortune from it.

But happily his name was not forgotten. Sometime after his death, a curious painting was made of him watching his wife at her knitting. He was represented as wearing the costume of his college, and pointing to an iron stocking-frame, while his wife was busy with her needles at his side. On the picture was this quaint inscription: "In the year 1589 the ingenious William Lee, of St. John's College, Cambridge, devised this profitable art for stockings (but, being despised, went to France); yet of iron to himself, but to us and to others of gold; in memory of whom this is here painted." The curious old picture long hung in the Stocking-weaver's Hall, in London, but has now disappeared.

So lived, loved, worked and died the modest scholar who gave to England one of her greatest industries, to which he was inspired by his tender affection for his wife.—*Harper's Young People.*

SUGGESTIONS ABOUT ENGINE RUNNING.

The following taken from the catalogue of a well-known firm of engine builders, contains so many pointers of value to those young in the work that we consider it worthy of reproduction:

Always start the engine slowly. After stopping for some time, and especially in the morning, the cylinder is cold, in which condition the steam is rapidly condensed as soon as the throttle is opened. If at this time the piston is allowed to make its regular stroke the water will not have time to escape before it, and the effect will be much the same as if a piece of iron were introduced between the advancing piston and the cylinder head. The result of this, even when not made immediately apparent by a serious breakdown, is to overstrain some of the parts, introducing the liability of a failure in the future. By slowly admitting steam and working the valve motion by hand until the cylinder is gradually and thoroughly warmed, all danger is avoided.

Oiling the engine, while always important, is especially so during the first three months' use. Oil holes should be carefully examined to see that they do not get stopped up with foreign matter, and the oil-cups occasionally cleaned. None but oil of good quality should be used, as nothing is further from good economy than using "cheap" oil on good machinery. Be sure that all oil-cups are filled and in condition to feed before starting. While attention to oiling is essential in the instance of all journals or wearing surfaces, neglect in the instance of the crank pin will be particularly unfortunate, as, if this pin is allowed to cut from the lack of oil, it is ever after liable to cause trouble by heating.

The cylinder lubricator should be examined occasionally to see that it is feeding regularly. None but the best cylinder oil should be used in the cylinder. Avoid the use of all animal oils or tallow, etc., as, when exposed to the heat of the steam, they become gummy, adhering to the parts and not unfrequently chemically attacking and destroying them.

Packing the piston rods and valve-stems of a steam engine hardly ever receives proper attention. The packing should be in a condition to prevent the escape of steam, and, at the same time, be soft and pliable to avoid friction and injury to the rods and stems. The most common fault in this respect is in allowing the packing to remain unchanged until it becomes so hard and gritty as sometimes to cut the brass valve-stems nearly in two. We recommend that the packing be entirely removed from the stuffing boxes once in three months, and new packing substituted. In removing the packing care should be taken not to scratch or mar the valve-stems. In no other case should the stuffing box be screwed more than sufficient to stop the escape of steam, when, if the packing has been properly done, the stems will be quite free to move, and abrasion will not occur. The packing for use should be kept in some place where it will be free from the accumulation of dust and grit.

Uselessly tinkering with the engine frequently causes trouble. So long as it is performing satisfactorily it should be let alone. Many good engines are ruined by ill-advised zeal. When it becomes necessary to adjust any of the parts, it is better to stop short of going too far, even at the risk of trying a second time, than to go too far and cause trouble.

THE DANGER TO LIFE AND PROPERTY FROM THE ELECTRIC WIRE, AND THE REMEDY.

At the convention of the National Association of Fire Engineers, at Providence, R. I. Prof. John P. Barrett, superintendent of fire alarms in Chicago, read a paper on the danger arising from electric light wires, and the underground system, in the course of which he spoke of the only means of prevention, as follows:

The surest and simplest remedy, the most perfect guard against danger to life and property from electric light wires, is inspection at the hands of some competent party, who should be clothed with authority to compel obedience to his just requirements. Again, the dangers from electric light wires

are materially lessened when these are placed beneath the ground, where contact with other wires, roofs and buildings is impossible, and where a loosened wire cannot drop across the street or sidewalk. I must strongly urge upon all the great necessity as a precaution, a life-saving measure, of having some check put upon the unsafe methods of the electric light people. The methods of accomplishing this are simple, and if an effort is made can be successfully carried out. The fire departments and the insurance men are natural and friendly allies. If these but pull together for a general purpose they must succeed, and no stone should be left unturned until every electric light plant in this country is subjected to proper inspection and control, and every wire, where possible, is put underground. I will conclude this paper with a few remarks as to why I consider underground wires the proper thing for cities generally, and for fire and police alarm service in particular, together with a short description of the system now existing in Chicago.

It is generally acknowledged that in a large, prosperous and wealthy city, where fire and police departments are considered necessary, that a simple, effective and reliable fire and police alarm system is indispensable. Such a system is in use in every large city in the country, and the electrical and mechanical parts of it have been so perfected by the work of earnest and scientific men that, as you know, a child can give an alarm that will at his choice summon either department to extinguish a conflagration or suppress a riot. But with the onward march of science; with the improvement in the equipment of the fire and police department, with the improvement in the mechanism of electrical instruments, and the mastery that man has gained over electricity, the method of stringing wires for electrical use has not kept pace; in other words, the lineman has not kept up with the procession. In any large city in the land you can see huge poles towering aloft, carrying tons of iron wire; you can see these wires crossing and recrossing the streets until it would seem as though you could not fire a bullet in the air without striking one. You can see them fastened to the same old cross-arms, uprights, brackets and insulators that we saw years ago. A menace to life and limb of the passer-by, a hindrance to the fire department and a general nuisance to everybody.

It has long been my conviction that the proper place for electric wires in a large city is under the surface of the earth. Especially is this true of fire and police wires. In a system from which so much is expected, where a single broken wire may cause a delay in giving an alarm, involving a loss of thousands of dollars, it seems to me that we should have the wires in a place where wind, sleet and sulphurous gases cannot harm them. To be perfect, a fire alarm system must be certain. It should be an absolute certainty that when the hook in a fire alarm box is pulled down an alarm will be given to which the department will respond. We cannot have this certainty in our present system of aerial wires strung in the neighborhood of hundreds of other wires, subject to the destructive action of smoke and storm, liable to accident from countless causes; there is no reasonable certainty that, at the

time a box is pulled, the line to which it is connected is not opened or crossed in such a manner as to render it for the time being useless. With a wire of suitable conductivity, well insulated and protected from mechanical injury, placed underground, we will have this certainty, which the air line cannot give. That is the way I feel about underground wires, and I am backing up the faith that is in me by planting those of the Chicago fire and police alarm telegraph as fast as I can get money to do it with. With me it is not a question of hair-splitting argument. It is a question of money, of first cost; outside of that, everything is in favor of underground and against aerial wires, and that seems to be the general sentiment.

WONDERFUL STRENGTH OF THE PORTERS OF CONSTANTINOPLE.

Another curiosity of Constantinople, which does not excite disgust, but, on the contrary, a surprise akin to admiration, is the *hamel*, or porter. His name, which has in Arabic the same origin as that of camel, describes him quite well. He is, in fact, a camel without the hump; but this hump is, however, more or less represented by a large leather cushion resting on his back, and intended to support his burden. Moreover the Turkish porter has the sobriety, the patience and the strength of the camel.

The French proverb, "As strong as a Turk," must have been suggested by the sight of this burden-carrying biped, whose back is strong enough to bear frightful loads. One hardly dares to tell of some of their feats of muscle, for fear of being considered a boaster. Here are two, however: One day when I changed my lodgings, I had three men come to move my piano. They tied it up firmly with straps. Then two of them went away, and the third, stooping down, raised the piano, and, placing it upon his back, carried it a distance that took more than three-quarters of an hour. On another occasion I met a *hamel* who was carrying upon his back an enormous calash, the wheels and axletrees of which had been taken off and fastened to one side of the vehicle. The only thing wanting was the two horses on his arms. The passers-by, accustomed as they were to these prodigies of strength, stopped to see this diminutive Hercules walk by, who disappeared under his load, taking an easy and even step, and uttering at the same time the word "guarda."

The frugality of the *hamel* is equally surprising. Who knows but it is one of the secrets of his strength? He never eats any cooked food, except a little rice, and a kind of soft and insipid sea-cracker, called *pide* in Turkish, and taking the place of bread. His ordinary food consists of cucumbers, which he eats with the skin on, salad, without salt or seasoning, and uncooked onions.

*Hamel*s never drink any wine, beer or spirituous liquors, and thus present a conspicuous refutation to the claims of those that insist that the drinking of alcoholic and fermented beverages sustains and increases one's strength. In times of drought they follow the example of camels, their brethren. If they are thirsty, very well; they do not find fault, but wait until wet weather comes.—M. JULLIARD, in the June *Cosmopolitan*.

UNITED STATES MILLER.

E. HARRISON CAWKER, EDITOR.

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MILWAUKEE, JULY, 1887.

We respectfully request our readers when they write to persons or firms advertising in this paper, to mention that their advertisement was seen in the UNITED STATES MILLER. You will thereby oblige not only this paper, but the advertisers.

DULUTH will have a grain storage capacity, Sept. 1, 1888, of 19,200,000 bushels.

A CERTAIN editor in Indianapolis favors the organization of a new Millers' National Association. Are there any millers in Indianapolis that coincide with the editor's views? If so, let him speak out over his own signature.

WE acknowledge the receipt of a very handsome programme of the proceedings of the Fourth Convention of the National Association of British and Irish Millers held in London, June 15th, 16th and 17th, published by "The Miller," London.

A NUMBER of millers residing in South-western Illinois held a meeting at Centralia, June 14, and organized the Southern Illinois Millers' Association. Mr. Joseph Reichert, of Freeburg, Ill., is president. The next meeting will be held at Du Quoin, in November.

THE Minneapolis Millers had their fourth annual picnic on Lake Minnetonka, June 19. It passed off very pleasantly, and proved a success in every sense of the word. We regret that other engagements prevented the UNITED STATES MILLER from being represented on the occasion.

MESSRS. EDW. P. ALLIS & Co., of this city have taken the contract for building a 1200 barrel mill at Rat Portage, Manitoba, for the Lake of the Woods Milling Co. The cost will be about \$200,000. The power is furnished by two 60-inch wheels running under a 24-foot head.

THE exports of England to America during the years ended September 30, 1884, 1885 and 1886, show the following figures respectively: £32,773,896, £27,648,644, £34,481,724. Comparing the period of 1886 to 1885, there is an increase of nearly £7,000,000.

WE have received from Messrs. Howes & Ewell, Silver Creek, N. Y., a copy of their elegantly illustrated catalogue of "Eureka" Grain Cleaning and other machinery. It contains much practical information, valua-

ble to millers, and complete descriptions, with illustrations, of all the machines manufactured by this firm, which has been in business over thirty-one years. Copies of this catalogue will be sent free of charge on application.

A WELL-KNOWN New Orleans firm of dealers in corn products (corn meal, corn flour, hominy, etc.,) have written to us for addresses of modern mills turning out that kind of goods. We will send the names of such millers as reply to this to the firm asking for them, and in some instances at least it will no doubt result in a satisfactory trade.

IN this age of speculation when men are not satisfied with moderate profits, but seek immediate wealth, the risks of business become very largely multiplied. To be enterprising now, men must take great hazards; and neither ability, nor cunning nor industry, nor tiresome days, nor sleepless nights, can prevent risks from bringing losses, nor losses from producing bankruptcy, nor bankruptcy from creating fearful solicitude about the future of dependent ones.

THE *American Miller* seems to be worrying a good deal of late about the Millers' National Association. As the tenor of the articles in that paper for some time past has indicated that the Association did not amount to such a great deal, we don't see why the astute editor should worry this hot weather. He gently insinuates that the editor of this paper has misinformed him as to the strength of the Association. When asked by the Chicago editor what our estimate was of the number of members in the M. N. A., if we remember rightly, and we think we do, we said: "Probably not far from 200." Since then we have published (including this issue) the official list which is complete to June 1, 1887, with the exception of Illinois. The official list shows that our guess was not far out of the way. We may here, however, call the attention of the Chicago editor and of millers generally that the list includes a very large percentage of the large mills of the country. Further it may be well to bear in mind that the Association is simply for the benefit of its members, and does not require the aid of the *American Miller* or any other milling paper. Its members are, collectively or individually, evidently quite able to look after their interests. So long as the Millers' National Association works for the advancement of their own milling interests, their labors will in general be of benefit to the entire milling industry of the country.

BRADSTREETS' of July 2, says:

"The exports of wheat and wheat flour from eight Atlantic ports and California and Oregon from July 1, 1886 to June 25, 1887, have been 155,756,283 bushels, and the consumption for food, seed and manufactures, is placed at 335,000,000 bushels. The home crop of 1886 was 457,218,000 bushels, and it has been generally believed that the old stock amounted to 25,000,000 bushels, aside from 50,000,000 bushels "reserves." The "available surplus," aside from this 50,000,000 reserve, has, therefore, been disposed of, and the latter, by inference, is being drawn upon at the rate of about 3,000,000 bushels per week for export alone. As has been many times suspected, the crop

of 1886, as reported by the Department of Agriculture, is probably less than the quantity actually harvested. Either this is so, or the old wheat carried over has been underestimated or the home consumption has been less than the usual estimate of 4.65 per capita for food and manufactures, aside from seeding, as commonly computed.

ABOUT \$50,000 IN ROYALTIES.

A DECREE ADVERSE TO THE MILWAUKEE DUST COLLECTOR COMPANY.

A decree was entered in the United States court June 30, in the suit of Alvah H. Kirk and others against the Milwaukee Dust Collector Company, which perpetually enjoins the latter from manufacturing or selling any machines covered by the patents mentioned in the bill. It is also decreed that the Dust Collector Manufacturing Company account for all royalties on machines at the rates specified in the contract and on all fans sold as attachments to machines; also that the company account for all damages suffered by the complainants by reason of the granting of the injunctive order of Feb. 24 last. The court refers the case to the clerk of the court to state an account of such royalties, dismisses the cross-bill and orders the defendant to pay into court the royalties for May. The decree further states that the contract entered into between the parties, dated May 1, 1883, was terminated, and the license to the Dust Collector Company to manufacture dust collectors under the contracts was revoked by virtue of an option expressed and notice given by the complainants in March and April, 1885.

The suit was begun in the state court in the fall of 1885 and was removed to the United States court the following winter. The decree is adverse to the Milwaukee company and disposes of about \$50,000 in royalties paid into the hands of the clerk of the United States court.

THE "800" CANAL.

Montreal Gazette: If the present rate of development in the Lake Superior trade continues, the construction of a new canal at the Sault Ste. Marie, which Canada has undertaken half as a matter of self-defense, will be regarded within a few years as a matter of necessity. It is almost impossible to conceive the change that has taken place in the conditions of commerce in the near Northwest. In 1881 there passed through the the American canal vessels of a freight tonnage of 1,567,741; in 1886 the figures were 4,527,759. Last summer the average number of vessels passing through was forty-two a day, many of them of the largest class. The growth of the mining industry will, in the immediate future, call for an annual tonnage 1,000,000, in addition to that now employed, while the grain trade of Duluth and Port Arthur is destined to steadily increase. So evident is this that American papers are calling for an enlargement of the existing canal, to meet already perceived requirements. The construction of the Canadian canal will be justified, therefore, by a regard for the needs of our commerce; without consideration of contingencies that recent events have made possible, though not, it is hoped, probable.

NEWS.

BURNED, June 2, McBean Bros' elevator and 13,000 bushels of wheat, at Morris, Man.

BURNED, May 27, J. & S. A. Lum's mill at Renwick, Ia. Loss \$6,000; insurance \$2,000.

BURNED, June 13, E. O. Stanard Milling Co.'s "Eagle Mill," St. Louis, Mo. The Company have leased the Park Mill from the Kauffman Mill Co., to take its place to fill orders.

THE Grand Forks Roller Mills, Grand Forks, Dak., were damaged by the cyclone, June 16, to the extent of \$10,000.

JOHN WINES, formerly of Faribault, Minn., has removed to Coursen's Grove, Mitchell Co., Ks.

AT Union, Me., June 23, the mill known as the Pullen Mill was burned. The mill and machinery were valued at \$4,000, and the stock at \$5,000; insurance on the mill, \$2,500.

THE Prospect Machine and Engine Company, formerly the Cummer Engine Company, Cleveland, O., made an assignment June 16. Liabilities, \$200,000; assets \$500,000. An hour previous to the assignment a chattel mortgage for \$61,000 was given to several of the leading stockholders. Gen. M. D. Leggett, president, says the assignment was caused by the dissatisfaction of certain shareholders, and that the corporation would be reorganized.

WORK on the new Chamber of Commerce Building in Cincinnati, O., is progressing rapidly.

BURNED, June 23, a mill belonging to Blair & Alexander at New Brighton, Pa.

BURNED, the Farmers Mill at Otter Lake Mich. Loss \$15,000; insurance \$7,500.

THE contract has been let for the erection of the largest paper mill in the United States, at Appleton, Wis.

PLACING GRAIN-CLEANING MACHINES.

In too many cases improper attention is given to locating grain cleaning machinery in the mill. It is now so almost universally admitted that upon the proper and thorough cleaning of the wheat depends the purity of the flour, that it is surprising to note how meager are the accommodations usually set apart for the reception of the grain cleaners. A small space, scarce large enough to receive the separator or the smutter, or both, may be partitioned off in some corner of the mill, or they may be placed in the basement, and here in dirt and darkness is performed the operations upon which so much of profit or loss hinges. In many cases, of course, it will be perhaps impossible to provide, what we would deem almost vitally essential accommodations in order to secure the best possible results from the operation of the machines, but inasmuch as the more nearly perfection of accommodation is secured, the more satisfactory will be the operation of the machines; and, furthermore, as in some instances, ignorance of requisite conditions has been the reason why they have not been provided, we will, very briefly, state what we consider absolutely essential to be observed.

I. The machines should be so placed that quick and easy access may be had to every part. In other words, plenty of room *all around* the machines should be provided.

II. Plenty of light, daylight, to reach so far as possible, all sides of the machines should be provided for. The advantages of this can at once be discerned. In case of an accident the injury may be quickly gotten at and repaired. If necessity for adjustment arises, it may be quickly and intelligently effected. If the machine is not properly performing its functions, the reason can be easily seen, not guessed at. In addition to this, a machine which has plenty of daylight around it, is

absolutely certain to receive better attention, be more regularly oiled and cared for than one which stands in almost darkness.

III. Machines should be rigidly secured in position. The frame of the machine is intended simply to support the operating mechanism. If permitted to oscillate or vibrate, it will interfere materially with the operation of the working parts, and the result must inevitably be a more or less unsatisfactory product.

IV. Particular attention should be given to the arrangement of the dust-discharging spout. Too great length of spout trunk should be avoided. Abrupt turns in the trunk will detrimentally affect the operation of the machine. If discharge is made into a dust-room, the vent for escape of the air from such dust-room should never be less than three times the area of the trunk or spout discharging therein. In every case where such an arrangement is at all possible, each machine should have its own, separate, discharge spout or trunk, with separate and distinct outlet. Where this is not possible, then where connection with another trunk is made the area of the extension must equal the combined area of spouts or trunks at point of connection.—*From Howes & Ewell's New Catalogue for 1887.*

AUTOMATIC SPRINKLER PATENTS.

In the United States Court, on Saturday, June 1st, Judge Sage, in a suit by Charles Barnes against infringers of his patents for Sensitive Automatic Sprinklers for fire extinguishing, rendered a decision fully sustaining the validity of the Barnes patents, and declaring that Barnes is the first and original inventor of a sensitive automatic fire extinguisher possessing the requisite of prompt action at the incipency of a fire, "a point," the Court stated, "in testing the validity of the complainant's patent, that must be kept constantly in view." The Court said that in the case before it there was an illustration of that ingenuity in evasion which is not invention and does not avoid infringement. This remark would apply to the many devices in imitation of the Barnes Automatic Sprinkler being introduced by parties who display more ingenuity in evasion than in invention. One of the efforts at evasion of the Barnes patent was the use of a deflector instead of a rose head as a distributor. This the Court declares to be the equivalent of the Barnes mode of distribution, as the defendants' patent accurately describes what is accomplished by the Barnes rose head distributor. The Court says that the deflector was known before the date of the Barnes invention and is shown in Loftus' patent of March 2, 1880.

The conclusion of the Court was that the defendant infringes the fourth, fifth and sixth claims of Barnes' patent No. 233,393, of October 19, 1880. A decree for injunction and account was entered, and Gen. R. B. Cowen was appointed to take such account.

This decision awards to Charles Barnes priority of invention in points of sensitive automatic sprinklers, that are indispensable to their success as fire extinguishers, and without which no automatic sprinkler has yet been made that is of any value. The ingenuity which has been expended in efforts to evade the Barnes sensitive automatic sprin-

kler now goes for naught, as such evasions have been judicially declared not to be inventions and are infringements.

THE MILLING INDUSTRY IN GALICIA.

From some recently published official statistics it appears that there are in Galicia (Austrian Poland) 3,474 flour mills, of which 34 are steam mills, while 3,245 are classed as common mills, that is small country mills, and 112 are described as water mills fitted on modern models. The list is completed by 13 tide mills, 68 windmills, and 2 mills driven by horse gear. The Galician mills are owned by 3,000 different individuals, and employ 6,538 people. We have no official record of the amount of grain ground in these mills later than 1883, in which year it is recorded that the Galician mills operated on 3,622,837 meter-centners of wheat, the metercenter being equal to 220.46 lbs. The value of the flour exported from Galicia in this year was reckoned at four millions gulden, or about £33,000 sterling, as against fifty-eight millions of florins, or about £4,833,000 sterling, exported from Hungary during the same period. Formerly Galicia was a large flour-exporting land, but it has been driven out of this field of industry by Hungary. From 1860 to 1869 was the golden time of the Galician milling industry, which may be said to have reached its zenith in the latter year. From that time, what with Hungarian competition and business depression (it is well known that the commercial crisis of 1873 was especially severe in Austria), Galicia began steadily to decline as a milling and flour-producing land. The death-blow came, it is said, when some few years since Germany began to lay import duties on cereal products. Until 1879 both grain and flour were exported to Germany from Galicia, but in 1880 the German Government laid an import duty of 2 marks, or about 2s. on each 100 kilos. (220.46 lbs.) of flour, and in the following year, his was raised to 3 marks. Thus the Galician lost their last foreign customer.

DEY IS WELL.—*Texas Siftings:* "Mawnin', Brudder Smif! how's all de folks wid you?"

"Dey is well, bress Moses! One ob de chilluns was ailin' yisterday, but hit died jurin de night."

SITUATION WANTED.

Situation as second miller in Merchant or Custom mill. Have had considerable experience. Reference furnished. Address, R. A. BROWN, 501 5th St., Milwaukee, Wis.

J. A. McINTOSH,

Patterns and Models

35 & 37 SOUTH CANAL ST.,

Estimates Cheerfully Furnished.

CHICAGO.

PASSENGER AND FREIGHT

ELEVATORS

L. S. GRAVES & SON,

Rochester, New York.

YE FOWLER'S MILLS, MILFORD, CONN.

Established in ye Year 1639.

BY J. W. FOWLER.

On the second page of the First "Book of Records," under date of March 9, 1639, is found the following:

"It is agreed between Mr. Wm. Fowler and those of the Brethern, that he shall build a mill and a house for it, and doe all the worke to her for stones and iron worke, and all other materials fit for her and substantially done, and have her going by the last of September. When it is finished the Towne is to take it off, if they will for £180, or else the brethern are to appoint what towle he shall take as the profits of the mill and land allowed with the money disbursed."

Whether Mr. Fowler succeeded in "having her going" by the last of September, according to the agreement the records do not inform us nor do they show any further action on the subject until 1645, when it was

"Voted, That all the towne shall help Mr. Fowler to repair the mill, and he is to call for them every one a day till he have gone through the town, and those he is to have when he needs them. If it goeth not through the towne in one year the same is granted him till he hath gone through the towne."

The inference is that the brethren "passed" and he "went it alone."

One cannot fail to admire the nerve and grit of this man who single-handed in a country less than a year old, unhesitatingly submitted to the very liberal terms of "the brethren," to furnish all the materials himself, and in six months "have her going," and give them the option of taking it at a given price, "if they will," or give them the privilege of fixing the rate of remuneration as toll for providing them with the fruits of his enterprise.

His keen discerning eye, however, discovered the facilities, advantages and capabilities presented, and he accepted the situation, and at once proceeded to control the water power in its natural condition, to plot out the location, to build the dam, quarry out the millstones, and obtain the iron and other necessary material with the limited means of transportation.

All this was to be accomplished in the midst of arduous duties thrust upon him, filling various offices, and a leading citizen in the numerous projected improvements in progress.

The present energetic proprietor of the New Mill has converted as a stepping stone to its entrance, a rough uncouth mill stone, which has lain dormant about the premises for several generations, and which tradition says on examination by geologist and antiquarians, has been pronounced as undoubtedly the "original mill-stone," quarried and hewn out that way by Wm. Fowler, and used temporarily until a better substitute could be obtained. If these views are correct, then this was the stepping stone to his success, and has been after two hundred and fifty years appropriately utilized by the eighth William, as his successor.

If the present owner could be induced to part with it we do not doubt the "New England Historical and Genealogical Society" would gladly transport it to the "Hub," and have it shown up in a glass case as bric-a-brac. Already its fame has brought numerous applications from ladies and gentlemen of Boston, for clippings of it for that purpose, but until after the 250th anniversary of its birth in 1888 it cannot go.

LIST OF MEMBERS OF THE MILLERS' NATIONAL ASSOCIATION.

[Continued from June Number.]

IOWA.

City Mill and Elevator Co.	Sioux City.....	3
F. J. Woodbury & Son	Marshalltown....	2
W. D. Watrous & Co.	Cedar Rapids....	2
Charles City W. P. Co.	Charles City.....	5
G. N. Miner	Cedar Falls....	4
A. C. Tiede & Co.	Elkport.....	1
Bailey Bros.	Adel.....	1
		18

MICHIGAN.

H. A. Hayden & Co.	Jackson.....	14
Wm. Hayden	Tecumseh.....	6
Dewey & Stewart	Owosso.....	3
Jesse Hoyt & Co.	East Saginaw....	6
J. Jenks & Co.	Sand Beach.....	4
Turner & Reynolds	Stanton.....	1
		35

INDIANA.

Wm. Trow & Co.	Madison.....	9
Jno. Orff	Ft. Wayne.....	5
Heilman Milling Co. successor to Elles & Knauss	Evansville.....	5
Jos. Pollock	Vincennes.....	7
Inglehart Bros.	Evansville.....	6
Emmison & Callender	Vincennes.....	3
Elkhorn Mills Co.	Boonville.....	3
Jno. A. Thompson & Co.	Edinburgh.....	4
L. Niblack & Co.	Rockport.....	2
Geo. W. Callender	Greencastle.....	2
W. L. Kidder & Sons	Terre Haute.....	6
Pfeffer & Traudt	Mt. Vernon.....	3
J. W. Laubischer	Evansville.....	1
A. W. Loughrey	Monticello.....	3
Eckert Bros.	Jasper.....	3
R. D. Roberts	Monticello.....	3
		65

HOW OLEOMARGARINE IS MADE.

The process of making oleomargarine was discovered about 1872 by M. Hippolyte Mege, a French chemist. He was directed by the French Government to find, if possible, a chemical product that would take the place of butter for the poorer classes. By experimenting upon milk he found that it always contained butter-fat even when cows had been for a time wholly deprived of food. He then to produce this butter fat from the fat of the cow by chemical process and finally succeeded in getting a pure, sweet fat, free from all foreign odors, which by churning with milk was converted into palatable butter. Properly speaking the name oleomargarine should be applied to the butter fat, and the product obtained by churning this oleomargarine with milk is butterine. The name oleomargarine is from the two words oleine and margarine. Oleine is the thin oily part of fats, and margarine is a peculiar, pearl-like substance extracted from some vegetable oils and also from some animal fats, the name being of French origin, from margarita, a pearl. It was thought that oleomargarine was composed principally of these two substances, but chemists have since discovered that margarine is not a simple fat, but contains stearine, a substance which does not exist in pure butter fat, so that the name is really a misnomer.

The process by which oleomargarine is made may be described briefly as follows: Clean beef fat is thrown piece by piece into large tanks containing tepid water, where it remains for an hour or two, when each piece is taken out and thrown into another tank of pure tepid water. It is again thrown into a third tank and after the three washings the fat is dumped into cars and hauled to the top

of the building. Here it is put into a cylindrical machine where it is cut very fine by revolving knives, after which it is forced out through a fine sieve at the opposite end and falls into kettles which are jacketed and surrounded by water. This water is heated by forcing steam through it to a temperature of from 114 to 122 degrees Fahrenheit, and great pains are taken to keep it from getting above the latter point, as the lower temperature at which the fat is rendered the better the product. About 5 per cent. of salt is added to the fat when in these kettles, and it is kept continually agitated by machinery, and this with the salt causes the membrane or "scrap" to settle at the bottom and the pure fat to remain on top. The fat is now cooled by drawing off the hot water in the jacket and letting in cold water. It is then drawn off into settling kettles, which are also placed in jackets; here it is thoroughly skimmed and kept at a temperature of 122 degrees F. by hot water in the jackets for three hours. It is then drawn off through a fine sieve into tanks which are immediately removed to the "seeding-room," which is kept at a temperature of 85 degrees F., and here the fat is allowed to solidify very slowly. This process requires from 36 to 48 hours, and must not be hurried. At the end of this time the fat, which has assumed the consistency of mush, is pressed by being packed in cloths set in molds, the packages then being lifted out and set on plates of galvanized iron in a press. Here by the gradual application of force a pressure of about 3,000 pounds to the square inch is secured, and this is kept up until all the butter oil is squeezed out from the packages, and a cake of perfectly dry, hard, white stearine is only left. The butter-oil pressed out is received into a large reservoir and thence passed into clean tierces, where after solidifying it is sealed up for shipment. In this form it can be kept perfectly sweet for an almost indefinite period. When used for butter making it is churned in the proportion of about 442 pounds of butter oil, 120 pounds of milk, 37½ pounds of cream-made butter, and 14 ounces of bicarbonate of soda. To this some coloring matter is added and the mixture churned for some 50 minutes, giving as a result a smooth mass resembling an emulsion of cream. This is allowed to flow directly from the churns upon pounded ice or into freezers, which prevents the crystallization of the fat.

When oleomargarine was first made it was complained that it always had a gritty taste. This was caused by the crystallizing of the fat, and the method of preventing this by suddenly freezing the mixture was the discovery of Dr. Mott, of New York. This was found to make a great difference in the taste of the mixture, and of course converted it from an unsalable into a saleable article. Later experiments by Dr. Mott and M. Mege resulted in the discovery that to put the emulsion into ice-cream freezers and keep it constantly agitated until it solidified, was even a better plan than pouring it upon ice. Sometimes this butter is again worked with milk, but this is not usually considered necessary. It is worked over with revolving butter workers to work the necessary amount of salt well into it, and is then packed in firkins or made into molds. The general impression exists that oleomargarine butter is not cleanly in its constituents, but the facts is that not only must the mate-

rial used be of the cleanest and purest sort, but the processes must be in all respects cleanly to produce a sweet and palatable substance as the result. As no other result will sell in the markets, manufacturers are compelled to see to it that all necessary care is used in its preparation. Science shows that, chemically, pure oleomargarine butter differs but slightly from pure cream butter. By analysis the constituents of cream butter are: Water, 11.968; butter solids, 88.032. Those of oleomargarine butter are: Water, 11.203; butter solids, 88.797. Under the microscope there is no difference perceptible between the two substances.—*Chicago Inter-Ocean*.

NONSENSE

THERE is a livery-stable keeper in Houston, Texas, who is very careful to whom he hires his turnouts.

One Sunday afternoon a young married man called at the livery-stable and wanted a horse and buggy.

"Who is going along with you?" asked the livery-stable man.

"I am going to take my wife's mother out for her health, and you can put a hatchet and spade in the bottom of the buggy, as I wanted to bring in some young cedar trees to plant out at the cemetery."

"My buggies are all engaged, and if they were not, you would have to pay \$200 buggy hire for one afternoon."

"Why, how's that?"

"Besides, I don't want to be hauled up as a witness every time the court meets."

"Witness! What about?"

"And then you'll be taking a change of venue because public sentiment is down on you here, and I don't want to be attached by the sheriff as a witness, travel forty miles and be fined forty dollars, and then be black-guarded by three or four lawyers."

"Why, what are you talking about?"

"That's all right. I don't say you aint justified, but I aint no fool. When a man wants to take his mother-in-law out in the country for her health, with a hatchet and spade, and talks about planting things in the cemetery, I know all I want to. My buggies are hired for a year in advance. Just take your custom to some rival house. When I hire a buggy, I hire a buggy; and when I hire a hearse, it is a hearse. I don't want to do any business what's not legitimate."

It was spiteful, but spitefulness cannot be legislated out of human nature. "Did you hear that Mrs. Smith is having her picture painted?" "You don't say! That old thing!" "Yes, indeed; painted in oil." "Well, I never! In oil! If she ever wants to have a good likeness she'll have to be painted in vinegar."

A MAN was recently brought before a Yankton (D. T.) Justice of the Peace on the charge of assault and battery. "The complaint says that you attacked this man with a knife and nearly killed him; how is it?" said the justice. "Yes, I stabbed at him a few times; he came up to my house and began abusing me and calling me names and—" "That's no reason for assaulting him the way you did." "Hold on a minute, Judge; then he jumped around and said he could lick me and struck at me—" "Still you had no business to attack him so savagely; you nearly killed him." "That's all right, your Honor,

I'll explain; then he went on to abuse my wife and began chasing the children around the yard and—" "That will do—you had no excuse for attacking him with a knife; you should have called a policeman to remove him; I must hold you for attempt to kill." "Just another word, Judge; after that he walked over and kicked my dog and—" "Hey!—kicked that liver-colored bird-dog of yours?" "Bet he did, Judge; walked right up to him when he wa'n't doin' nothin' and kicked him right in the side." "Yes, and just as like as not injured him so you can't hunt with him this season; why didn't you tell me this at first? you did perfectly right in going at him with a knife, and I discharge you. Mr. Plaintiff, just whack up a \$10 fine to this court for kicking the dog."

ROUGH ON THE JUDGE.—I have just heard the following good story on Chief Justice Bleckly, says a writer in the *Augusta (Ga.) Chronicle*. All who know Judge Bleckly and recall his long waving hair and beard will appreciate the story. Judge Bleckly was on his way to the Supreme Court one morning when he was accosted by a little street gamin, with an exceedingly dirty face, with the customary "Shine, sir?"

He was quite importune, and the Judge being impressed with the oppressive untidiness of the boy's face, said:

"I don't want a shine, but if you go wash your face I'll give you a dime."

"All right, sir."

"Well, let me see you do it."

The boy went over to an artesian hydrant and made his ablution. Returning, he held out his hand for the dime.

The Judge said: "Well, sir, you've earned your money; here it is."

The boy said: "I don't want your money, old fellow; you take it and have your hair cut." Saying which he scampered off.

A GIRL OF ANOTHER COLOR.—*Boston Courier*: Too enthusiastic in his praise.—Wife—What do you think of the new girl, John?

Husband—Was that her that just let me in? W.—Yes.

H.—Well, she's just a daisy.

W. (icily)—Think so?

H. (enthusiastically)—Think so? Why, she has a complexion like a moss rose, and eyes like—like—I don't know what. And her teeth are splendid, too.

Next day when John went home to dinner he was let in by a girl with a complexion like polished ebony, eyes as large as saucers, and teeth like two rows of piano keys.

CORPORATE CONSIDERATION.—A claim against a neighboring city for damages on account of the drowning of ducks by a overflow of the drain suggests this anecdote: "Yer Honor," said a visitor in the Mayor's office, "me name is Patrick Murphy, and I live in East Boston. The rain has come into me cellar an' me chickens are drownin'." "Ah, indeed!" said the polite Mayor. "The Fire Department will attend to your case." "My name is Patrick Murphy, an' I live in East Boston. The rain has come into me cellar, an' me chickens are drownin'," repeated Patrick to the Fire Department. "You should see the Street Commissioners, Mr. Murphy," answered the Fire Department. Patrick repeated his case to the Street Commissioners and afterward returned to the

Mayor. "Yer Honor, me name is Patrick Murphy, an' I live in East Boston." "O yes," said His Honor. "I remember you perfectly. Didn't I tell you to go to the Fire Department?" "I did, Yer Honor, an' then I went to the Street Commissioners." "What did they tell you?" asked the Mayor. "They said, 'Why in the devil don't you kape ducks?'"

IN THE—regiment, Indiana volunteers, during the late war was an unusually eccentric native of "Erin Go Bragh," who had the fortune while on picket duty to capture a confederate soldier and take him to camp.

In the same company was a lazy and far from courageous comrade, who, seeing Dan with a prisoner to be turned over to the colonel of the regiment, said:

"Dan, you are obliged to go back on duty; let me take the prisoner up to headquarters."

"Bedad, an' not a bit of it. If you want a rebel go out and catch one for yourself. The bush is full of em," was Dan's reply.—*Detroit Free Press*.

Wall Street News: A Cleveland church deacon who had a few thousand dollars to spare was advised by a friend to invest it in oil. The deacon held off for a while, arguing that it was flying in the face of the Lord to enter into speculation, but he finally put up \$4,000, and in a few weeks came out winner by over a thousand.

"Well, I guess you have changed your mind about speculation," remarked the friend as he met him.

"Y-e-s, somewhat," was the reply. "I've kinder come to believe that the Lord has got me and Deacon Smith mixed up, for Smith went into wheat and dropped \$1,500 in a month."

A PHILADELPHIA society family is very angry because one of the young ladies of the family has married a base ball player. Strange that the family should not like it, as some of the greatest catches of the season are to be found among the base ball clubs.—*Detroit Free Press*.

BENEVOLENT old lady (addressing one of her proteges, a native of the Emerald isle)—Im am very much surprised, Mrs. Maloney, to see this pig living in the same room with you and your children.

Mrs. Maloney—Sure, marm, he's a very illigent crature, and particular; but he don't moind us, a tall, a tall.—*Life*.

AN INVENTIVE FARMER.—According to the *Los Angeles Times*, a farmer in that vicinity combines the faculty of adapting the means to the end desired in a degree that makes the successful inventor and engineer. He had a tract of land useless without irrigation, which he was unable to provide for in the usual way; and he also had a family of twelve children. In his case the rising generation of family offshoots were the means and irrigation the desired end. He had money enough to dig a well, by buying a low-priced pump and a gigantic family swing, of the picnic order. He connected the pump to the swing, gave the youngsters full liberty to amuse themselves with the latter, the result being a stream that makes the arid soil fairly smile. Nothing less than enough measles or whooping cough to go "all around" will stop the supply of water.

**AUTOMATIC ROLLER MILL OF HADLEY & CO.,
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Capacity 1400 sacks per day.

BUILT BY SECK BROTHERS, DARMSTADT,
GERMANY.

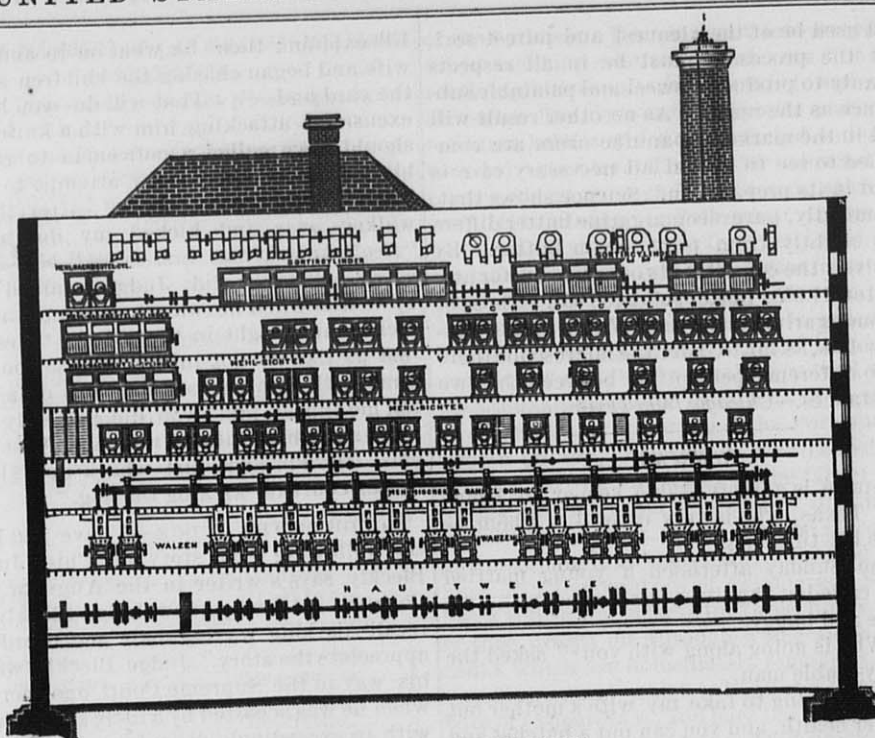
The illustrations herewith represent the new roller mill of Hadley & Co., in Newcastle-on-Tyne, England, now in operation for one year, the grinding capacity of which is 1400 sacks per day. It is a pleasing indication of the fame attained abroad by German milling architecture, that the construction of this mill, one of the largest in England, was awarded to a German firm, Seck Brothers' machine works at Darmstadt, upon the merits of their automatic roller system.

The structure, part of which is only given in our illustration, consists of three distinct buildings, viz: (1) The grain-cleaning house, which was built new; (2) the mill building proper, which has been utilized as a warehouse for years, and running parallel with the grain-cleaning house, from which it is separated by a spacious court, and (3) the grain and flour elevator.

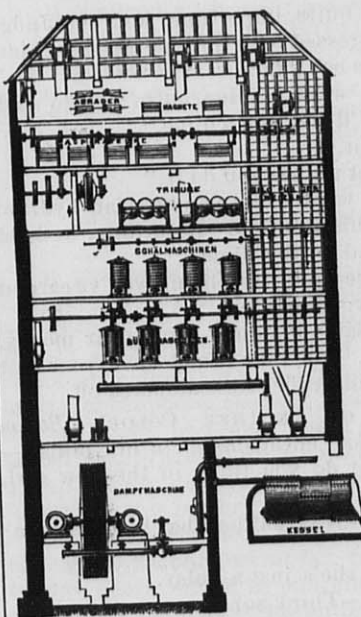
(a) GRAIN ELEVATOR.—The grain elevator is built after the silo system, and is supplied with all the necessary mechanical contrivances for rapid transmission of grain, for conveying the same, for automatically mixing of the different grain varieties, for the preliminary cleaning of the same, and for "turning." The buckets for filling silos have a capacity of 30,000 kilogrammes per hour; it empties upon an automatic scale, and then the grain, the weight being established, passes two elevator aspirators, built in zigzag manner with seven sieves each; these are brought into service for the removal of coarse impurities, such as straw, stones, etc. Adjoining these are ten separate grain chambers (i. e. silos), at the top of which there is a spiral contrivance that conveys the grain taken from the aspirators to any one of the silos. The silos have a capacity of one million kilogrammes. The spout of each one of the ten silos is supplied with a mixing apparatus, which empties into an accumulative mixing conveyor, which now transports the mixed grain to the grain cleaner. These mixing apparatuses are constructed in such a manner, that by means of a small slide any desired quantity of grain may be withdrawn from the silos, and thus, in a purely mechanical manner, accomplish the desired mixing of the grain. The spiral mixer, alluded to above, then conducts the grain to the

(b) Grain-Cleaning Building.—The same consists (see cut) of basement, which was used as engine room, and five stories above, now occupied by the cleaning machinery. The grain brought over from the warehouse by spiral conveyors first passes four large sieves, which remove all rough impurities, and at the same time separate the large and small wheat.

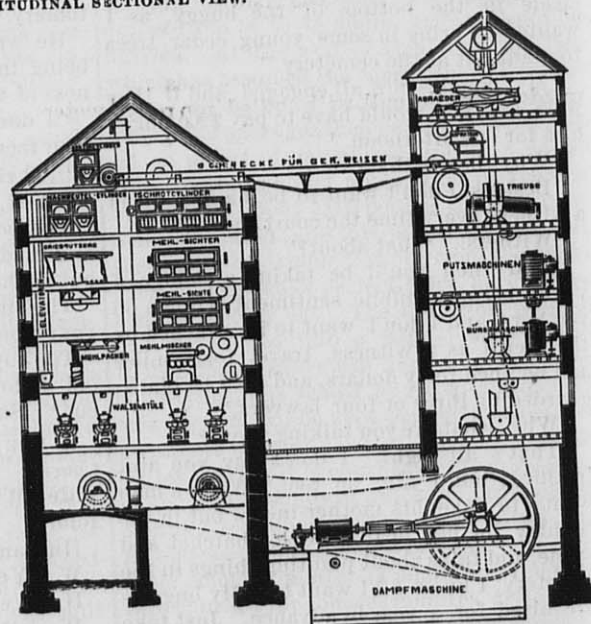
The grain then reaches two large Seck Magnetic separators, which remove all particles of iron and wire, and thence five powerful aspirators, followed by six Seck cockle separators of 700 millimetres diameter. On the fourth floor will be found four Seck grain cleaning machines, from which the grain finally passes to four Seck brushing machines. The cleaned grain is then stored



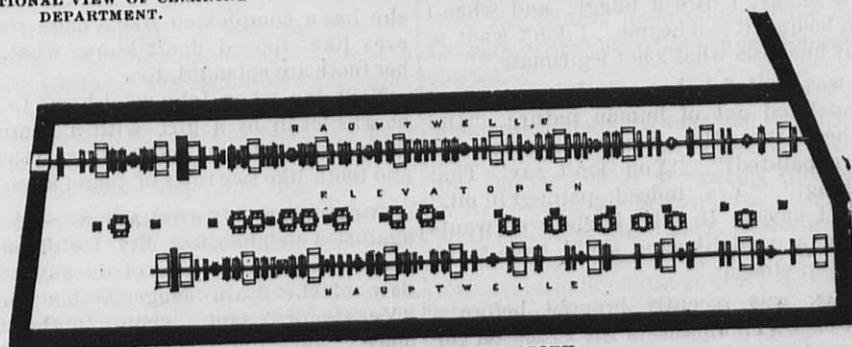
LONGITUDINAL SECTIONAL VIEW.



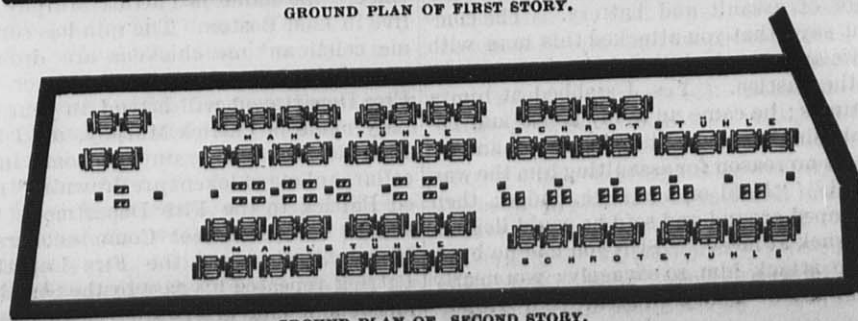
SECTIONAL VIEW OF CLEANING
DEPARTMENT.



CROSS SECTION OF MILL AND CLEANING DEPARTMENT.



GROUND PLAN OF FIRST STORY.



GROUND PLAN OF SECOND STORY.

in large receptacles specially reserved for it, and is then carried by elevators (see cut) from the grain-cleaning building by spiral conveyors to the mill for grinding. Besides the spiral conveyor there is no other connection between the mill and the cleaning building, forming quite an item in the cost of fire insurance.

(c) *The Mill* proper consists of a building 138 feet long and 38 feet in width, formerly used as a warehouse. In the basement the two main shafts are located that transmit the driving power for the entire building, which is furnished by an engine. Four cornered leather belts are used throughout the mill. One hundred and twenty belts are necessary for the driving of the roller mills. To the ceiling of the basement the spirals are attached, which, dispensing with tubes, transport the ground material from the rolls located above to the fourteen double elevators.

The Roller Floor.—When entering the roller floor, on one end of the mill, it presents an imposing, yet very harmonious view. One hundred and twelve pair of rolls in four double rows along the entire length of the building meet the eye of the visitor. Forty-eight pair of rolls serve as break and sixty-four pair for the grinding of the grits and dunst. The grinding is done, as stones are excluded from the mill, with chilled iron rolls. All roller mills were furnished by Seck Brothers, of Darmstadt, and each is supplied with four horizontal chilled-iron rolls 750 millimetres in length and 220 millimetres in diameter. The pressure of the Seck rolls is obtained partly by levers and partly by weights. Every pair of rolls has its own driver, and in order to avoid all noise, the gearing runs entirely in oil, covered by securely closed boxes. The wood-work of the roller mills is polished black walnut and all are furnished with ventilators. Each roller mill has a funnel fastened to the cover, with long narrow glasses inserted on each side, which shows the flow of the ground material. The automatic milling in this mill, in which all filling is dispensed with, and where systematic running depends upon the regulation and feed of the rolls, enables the operator to see on the funnels whether there is any deficiency in the feed of the roller mill or not.

The Flour Floor.—The second floor serves as a receptacle for the finished products, flour and wastes. Sacks will only be found on this floor of the mill. The gathering and mixing of the flour is accomplished by means of four spirals of thirty centimetre diameter, in close proximity, about one metre above the floor, along the entire length of the building, which, in following the flour tubes coming from above and connected with the flour sifters, render it very easy to test each kind of flour. Conforming to the sixteen flour sifters on the next floor above, there are placed upon the fourfold flour gathering and mixing spirals another sixteen flour mixing apparatuses, which center into four spiral flour conveyors, thus enabling the miller in charge to conduct the flour descending from above into any one of the four spirals mentioned by means of a turning slide. The flour is then carried by the spiral flour conveyors to the so-called safety cylinders, of which there are six, each six metres in length, on the upper floors. Along

the wall the flour packing machines are placed, and, leaving these it is transported direct into the warehouse.

The Grits Floor is in the fifth story. Twenty-two fourfold Seck suction grits and dunst-cleaning machines are placed in a row along the wall. The grits and dunst machines located above furnish the feed, while the cleaned grits and dunst are carried direct to the smooth rolls by tubes and spiral conveyors. The shelling cylinders, the grits and dunst assorting cylinders are placed on the fifth and sixth floors and under the roof, and their symmetric positions afford a neat view and serve as a good illustration for utilizing space. Twenty-two Seck sifting machines are used for sacking the flour, all built with cast iron frames. As will be seen in the illustration, all elevators are set in a row in the middle of the building. Before the first break-roll as well as between the single break passages, strong aspirators are placed which, in the first place, clean the wheat once more, coming from the cleaning floor, and, secondly, to remove the light bran, caused by the several breaks, before it reaches the next rolls. The necessary power for the mill as well as for the three dynamo machines which feed 260 electric lamps, is furnished by a 500 horse power engine, a so-called twin machine. The fly-wheel of the same has a diameter of six meters.

The small number of employes about the mill seems strange to the visitor. This circumstance is easily explained, however, through the entirely automatic grinding process of the Seck system. From the moment the raw material enters the elevator to the sacking of the flour and waste, human labor is unnecessary; there are no sacks to take down, and the distribution of the different products is done by means of spirals and tubes. The greatness of the construction, its good results, and the fact that the entire fixtures and all machines were furnished by Seck Bros., of Darmstadt, truly speaks well for the fame of German mill-builders.

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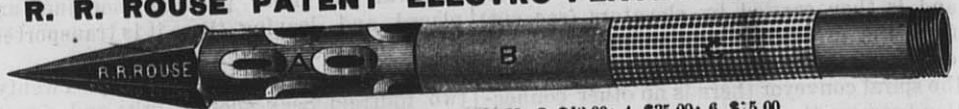
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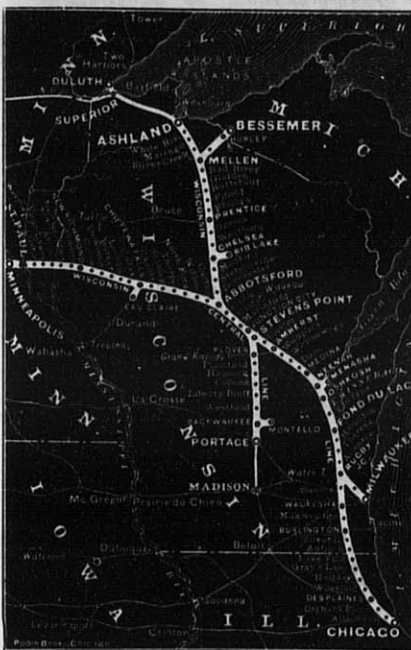
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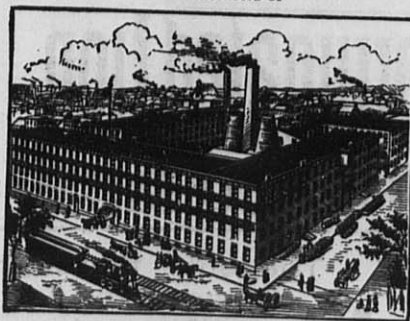
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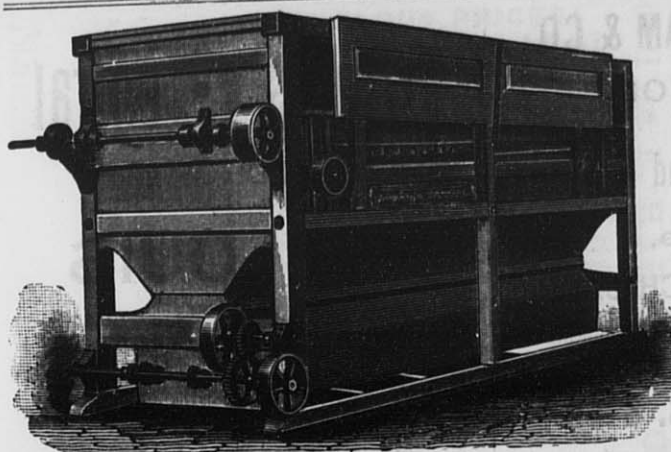
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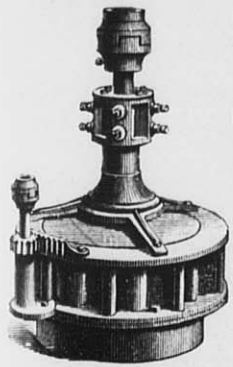
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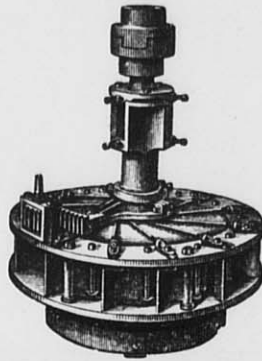


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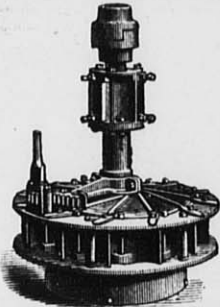


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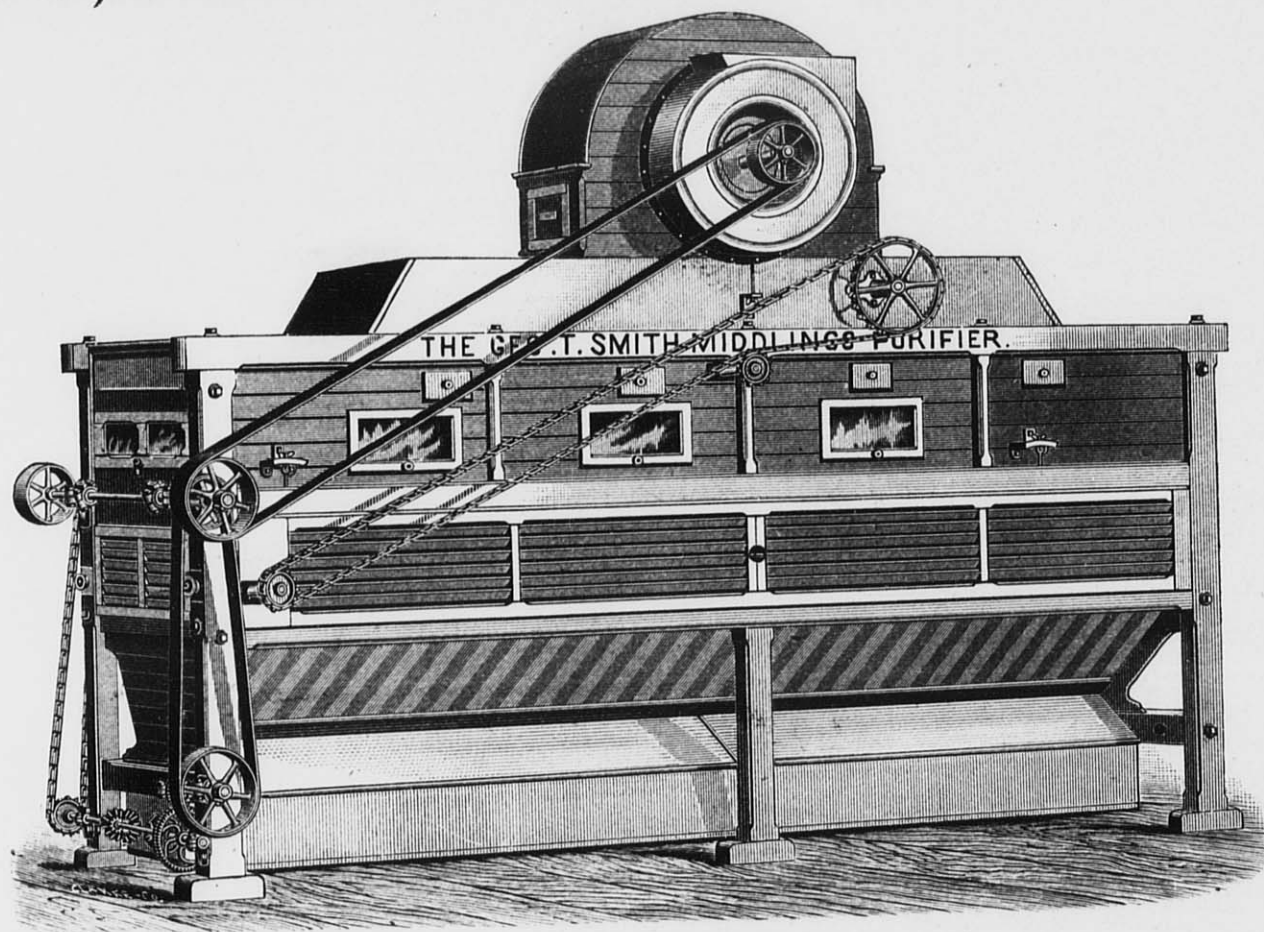
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